OBESE ACTIVE DUTY MILITARY MEMBERS: IMPROVING SCREENING, DIAGNOSIS AND ACCESS TO WEIGHT MANAGEMENT SUPPORT IN PRIMARY CARE

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ABSTRACT

Julie A. Thomas: Obese Active Duty Military Members: Improving Screening, Diagnosis and Access to Weight Management Support in Primary Care
(Under the direction of Rebecca Kitzmiller)

Background: In 2015, 61% of active duty (AD) U.S. Air Force (USAF) members were categorized as being either overweight or obese. Although the USAF Behavioral Health Optimization Program (BHOP) has a weight management program, it remains underutilized by USAF primary care managers (PCMs). This process improvement project aimed to improve weight screening, diagnosis, patient counseling documentation, and scheduling obese members with the BHOP weight management program.

Methods: Conducted at a single USAF primary care clinic, the intervention included: an evidence-based weight management education session; provision of a stakeholder-informed screening and service access protocol; and employed a champion and a reminder system. The following data were collected pre-implementation, during project implementation, and post-implementation for each relevant obese AD appointment: height, weight, and BMI; obesity diagnosis; documented counseling, and scheduled BHOP appointment. Data were compared across time points using repeated measures logistic regression.

Findings: 1,631 AD appointments were analyzed. Family practice obesity and weight management counseling documentation was statistically significantly lower between pre and post intervention time periods. The BHOP appointment rate increased (2.9% to 5.9%). Flight medicine height, weight, and BMI documentation initially improved (79.2% to 87.6%), as did counseling documentation (14.3% to 25.9%), and BHOP appointments (0% to 12.5%).

However, obesity diagnosis decreased (13.3% to 7.4%). The walk-in care team experienced a non-significant decline (90.9% to 77.4%) in height, weight, and BMI documentation. insufficient data prevented analyzing diagnosis, counseling, and appointing changes.

Implications: Although this project targeted a significant military health issue and employed evidence-based implementation strategies, little relevant improvement was seen. Process improvement studies noted that genuine change(s) in practice are difficult in any setting, which is likely further complicated when attempted in military care settings due to additional duty requirements. Research among civilian PCMs suggested that providers struggle with weight management counseling, either because they are uncomfortable with the topic, or they perceived that patients were unwilling to engage in behavior change. Military healthcare providers may well need additional supports to assist AD personnel in maintaining appropriate weight, as this is essential to maintaining the military mission as well as for the long-term health of the military members.

I’d like to thank my parents for always being there and encouraging me in everything. To my Mom, who remembers her own graduate academic journey and could say, “Yes, I understand exactly what you’re going through,” and to my Dad, the best proof-reader in the world.

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LIST OF ABBREVIATIONS

AD	Active duty
BHOP	Behavioral Health Optimization Program
BHOP RN	Behavioral Health Optimization Program Registered Nurse
BMI	Body mass index
CHCS	Composite Health Care System
DoD	Department of Defense
EHR	Electronic health record
GPM	Group practice manager
IDMT	Independent Duty Medical Technician
med tech	Medical technician
MTF	Military treatment facility
PCM	Primary care manager
TPB	Theory of Planned Behavior
USAF	United States Air Force

CHAPTER 1: INTRODUCTION

Problem Statement for Obesity Rates in the United States Air Force

As the obesity epidemic continues to grow in the United States (U.S.), members of the USAF also struggle with weight and weight management. According to the National Institute of Diabetes and Digestive and Kidney Disease (NIDDK), "more than 2 out of 3 adults are classified as either overweight (BMI≥25) or obese (BMI≥30)" (National Institute of Diabetes and Digestive and Kidney Disease [NIDDK], 2013-2014, p. 1). From 1995-2008, the rate of overweight and obese active duty members within the Department of Defense (DoD) increased from 51% to 60% (Reyes-Guzman, Bray, Forman-Hoffman, & Williams, 2015). In a 2015 survey conducted by the Rand Corporation, 61% of USAF active duty members can be classified as either overweight or obese (RAND Corporation, 2018). The USAF provides weight management services through its Behavioral Health Optimization Program (BHOP). However, USAF Primary Care Managers (PCM) fail to regularly recommend this program to their overweight and obese active duty members (Landoll, Nielsen, & Waggoner, 2017). Lack of utilization of BHOP weight management may negatively impact the USAF mission readiness of, "Fly, fight and win in space and cyberspace" (https://www.airforce.com/mission) due to the negative impact of weight on job performance, as well as the risk of developing weight-related comorbidities (Reyes-Guzman et al., 2015).

The USAF is not just a flying organization, as only a small percentage of members are pilots. The remainder of USAF personnel are responsible for preparing pilots, crew, and aircraft for flight operations, while others manage day-to-day organizational operations such as

finance, transportation, housing, supply management, and health care. All members work together in order to complete the USAF mission. To be "mission ready" means to be physically, mentally and emotionally prepared to fulfill one's specific set of job requirements.

Beyond mission impact, being overweight or obese may also affect an Airman's well-being and career. Individuals categorized as either overweight or obese are at increased risk for other comorbidities such as hypertension, diabetes, sleep apnea, and chronic pain (Rush et al., 2016). Patients who are overweight or obese are also more likely to be diagnosed with mental health conditions such as depression (Rush et al., 2016). These comorbidities can result in chronic pain, degeneration, and possibly surgery (Reyes-Guzman et al., 2015; Rush et al., 2016) and may impact a USAF member's ability to meet the physical demands of their position. Further, excess weight may negatively impact job performance due to absence from the work place to treat co-morbid conditions. Failure to meet fitness standards is a common reason for a members' discharge from active duty (Tanofsky-Kraff et al., 2013). Recent DoD changes initiated by the former Secretary of Defense mandated that all active duty members in all military branches must to be worldwide deployable (Copp, 2018). If individual health issues prevent a member from being mission ready, and they are therefore non-deployable for 12 months or more, then that individual's Commander will begin the process of separating that member from service (Copp, 2018).

Better utilization of the BHOP weight management program may be one mechanism for reducing the number of overweight and obese active duty USAF members. Within the primary care setting, emphasizing the need for appropriate weight management begins with consistent screening and diagnosis, and is followed by a provider-patient conversation about weight management including the use of BHOP. Standardization within the USAF military medical

treatment facilities (MTFs) makes implementing an USAF-wide weight management program a viable option.

Purpose of the Project

The project: 1) educated primary care staff members on current weight management standards of practice with emphasis on the importance of consistent assessment and diagnosis documentation in the electronic health record (EHR); 2) encouraged clinic staff to engage in informed patient counseling; and 3) simplified the process of scheduling patients to BHOP weight management. As a result of these changes, the overweight/obese USAF member is more likely to obtain the guidance needed to achieve Air Force fitness standards. Currently, Air Force Primary Care Managers (PCMs) are encouraged, but not mandated, to send any active duty member with a BMI $\geq$ 30 to BHOP for weight management (*DoD Pathway*, 2014). However, weight management is, at best, mentioned to the member as "something you need to work on," and at worst, ignored due to other pressing diagnoses (McHale, Laidlaw, & Cecil, 2016). This may leave the member ill-prepared to self-manage their weight. At present, there is no standardized process within the USAF for sending patients to BHOP. It is a service where patients are able to "self-refer" without the need to see their PCM first. If a PCM determines that an active duty member would benefit from attending the BHOP weight management program, the PCM can instruct the patient to call and schedule an appointment. While many patients may have good intentions to follow the recommendation, there is no obligation to follow through, and the advice is frequently forgotten. As an alternative, the PCM or a team member may escort the patient to the BHOP office and assist the member in scheduling an appointment. Unfortunately, this method is time consuming for PCMs with an already tight schedule. To date, regular reports from BHOP to primary care clinic commanders

indicate that the numbers of patients in the program were consistently lower than the expected number of potential enrollees, suggesting an opportunity for improvement.

Significance to Nursing

Overweight and obesity are a worldwide concern. In the military, both active duty and civilian nurses have a professional obligation to combat this treatable diagnosis. There is well documented evidence that by managing weight to a healthy BMI, other comorbidities will also improve (Ryan & Yockey, 2017). As members of a complex healthcare delivery system, nurses and providers have an opportunity to work together to combat this epidemic.

Review of Literature

Search Terms, Databases Searched

I conducted a literature search to determine the effect of educational interventions about the importance of appropriate overweight or obesity diagnosis on provider documentation behavior, and the effect of efficient weight management referral processes on providers' referral behavior. Information on this subject was gathered from PubMed, CINAHL, and PsycInfo data bases. Search terms included *weight management, overweight, obesity, active duty military, Air Force, primary care providers, screening, integrated care*, *behavioral health*, and *barriers*. The following inclusion criteria were applied: written in English, adults ages 18-64, Primary Care, and Acute Care. No date limits were set in order to capture all available literature; however, I attempted to focus primarily on studies conducted within the last 10 years. Studies from both civilian and military health organizations were included since weight management is a significant concern for all US citizens. Pub Med and CINAHL yielded the majority of the literature with a total of 844 articles (Figure 1). Once duplicates were removed, 740 articles remained. Titles were then reviewed to identify pediatric/adolescent population, non-U.S. military populations, pregnant women, or behavioral health within a mental health setting,

resulting in 189 articles retained. Although one study was conducted in a pediatric setting, researchers described using a notification system for overweight and obesity within the EMR and thus was applicable to this project. Abstracts were then reviewed to identify research studies that specifically used measures of height and weight, versus body fat, as this is the standard USAF measurement approach. 18 were retained and reviewed in depth. Five additional articles were eliminated due to the study's focus on body fat measurement rather than weight diagnosis, or the article evaluated non-behavioral health weight management programs, which was not the purpose of this search. This left a total of 13 articles. The references of these articles were reviewed, and four additional articles were found, bringing the total number of articles for this review to 17.

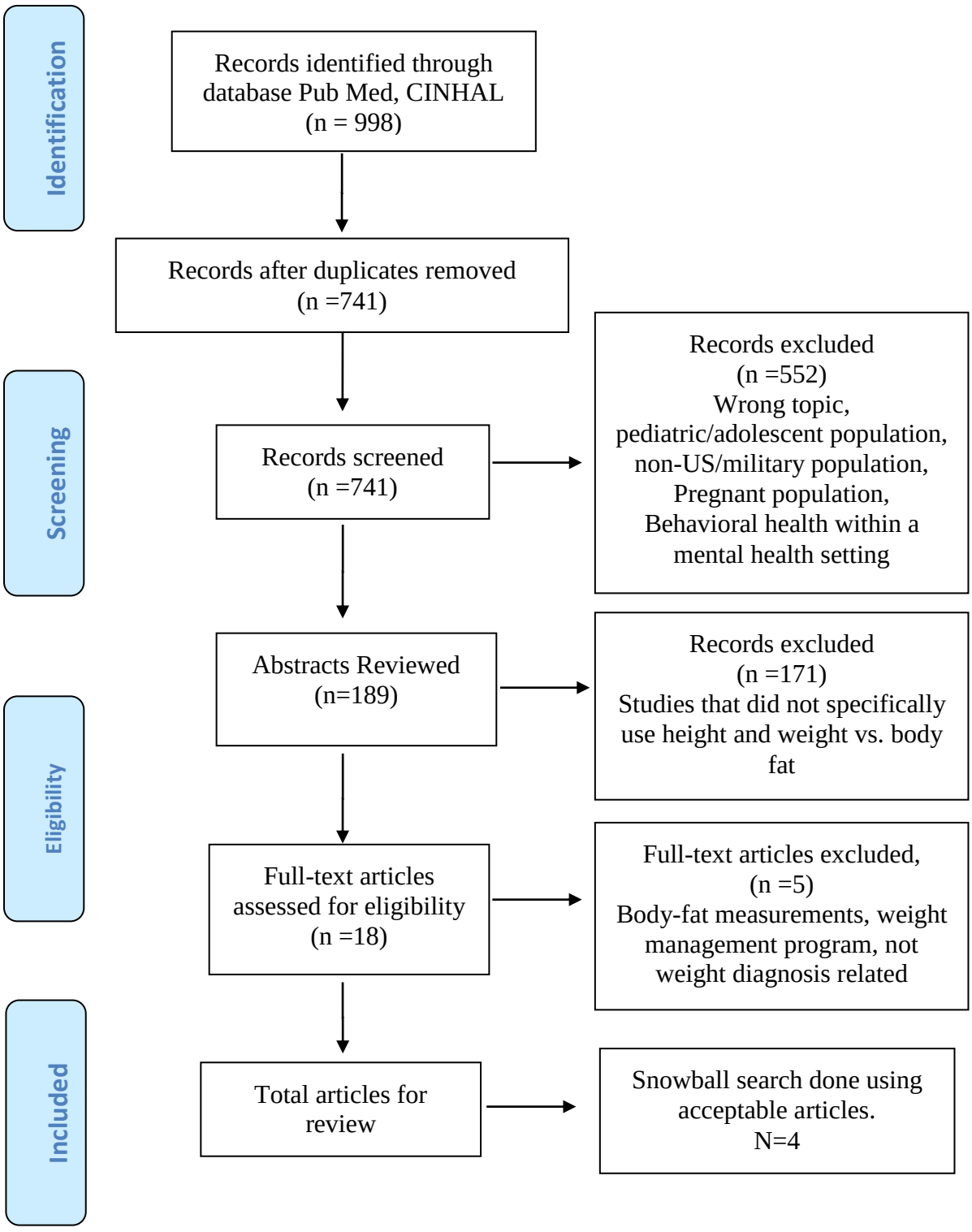


Figure 1. PRISMA Diagram

Adapted from: Moher, D., Liberati, A., Tetzlaff, J., Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Literature Review and Synthesis

Seventeen articles met criteria for this review and included 13 primary research studies, three literature reviews, and the USPSTF recommendation statement. Study sites ranged from small, individual practices, to a single large university medical setting. This suggested that the issue of addressing overweight and obesity is not just limited to one type of care setting, but may affect all populations nationwide (Jay et al., 2009; Landoll et al., 2017). Thirteen studies were conducted among civilian populations, while four were among military populations. Of the six articles that specifically measured gender (Aveyard et al., 2016; Blackburn et al., 2015; Jay et al., 2009; Leverence et al., 2007; Loomis et al., 2001; Pool et al., 2014), the percentage of males and females were generally equally distributed. Race was rarely specified as a variable.

While many of the articles relied upon descriptive statistics, when appropriate, p-values of statistically significant tests ranged from <0.05 to 0.001. Many of the articles used either chart reviews or survey data. Only McHale et al. (2016) conducted a systematic review on patient-provider weight-related discussion within which the authors provided included study details in a literature matrix with p-values and confidence intervals (CI). Although the review did not include randomized control trials, overall, the authors were comprehensive in their review.

Five topic categories were identified during this review: four articles examined diagnosis/coding, three examined guidelines, six reviewed and evaluated the importance of patient-provider discussion, four described provider perceptions/attitudes toward obesity and weight management, and three evaluated the impact of behavioral health interventions on weight management, including barrier identification. Overall, these studies offered significant insight into why providers failed to document and manage their patients' weight issues. Study designs included three qualitative studies, four cross sectional surveys, three systematic reviews, two

randomized control trials, two interventions, a case control study, a data query/chart review and the USPSTF recommendation statement.

Patient-Provider Discussion

Research indicated that PCMs fail to consistently address the subject of overweight and obesity with their patients. Not only are military PCMs not addressing patients' weight, but Stephens et al. (2011) found that patient records frequently do not even have a diagnosis code of either overweight or obesity. Barnes et al. (2014) introduced an intervention to encourage PCMs at a large state university medical school primary care clinic to document a BMI with each patient encounter, and if appropriate, a diagnosis of either overweight or obesity. Although there was a small increase in the percentage of recorded BMI, there was no statistical difference in the documentation of an overweight or obese diagnosis from baseline (Barnes et al., 2014). Interventions to remind providers to appropriately diagnose overweight or obesity status failed to achieve significant change due to several shortcomings: small sample size, single site implementation, and a primarily Caucasian population (Barnes et al., 2014). The project lead communicated by email with the providers/team once a week, and provided a single audit/feedback report, during the project implementation period (Barnes et al., 2014). Lack of significant improvement suggested that providers may need more frequent feedback and encouragement to sustain significant change. In addition to a bi-weekly email, the PI in this study conducted bi-weekly site visits.

Not only do PCMs fail to discuss overweight or obesity with their patients, but weight counseling decreased from 7.8% in 1995-1996, to 6.2% in 2007-2008 (Kraschnewski et al., 2013). This trend continues despite evidence demonstrating that even brief provider-patient conversations have a positive impact on patient weight loss (Aveyard et al., 2016; Pool et al., 2014). When providers discuss weight management with their overweight and obese patients,

they are more likely to self-report a 5-10% weight loss over the next year (Pool et al., 2014). In a randomized control trial by Aveyard and colleagues (2016), obese patients were divided into two groups of advice only, or advice plus support in the form of a referral to a weight management program. The authors found that even a brief intervention of only providing advice for weight loss resulted in 14% of subjects losing 5% of their bodyweight, 6% of subjects achieved a 10% loss. Further, when providers took the additional time to recommend weight loss *and* then referred the patient to a weight management program, the results nearly doubled with 25% and 12% of patients achieving a 5% and 10% weight loss respectively (Aveyard et al., 2016). Therefore, this project incorporated clinic staff providing patient counseling about overweight and/or obesity risk and weight reduction strategies.

Obesity Guidelines

Current guidelines recommend that PCMs review and discuss patients' weight and BMI annually (U.S. Preventative Services Task Force, 2018). However, studies noted that PCMs did not follow these recommended guidelines for weight management because of a lack of adequate appointment time (Briscoe & Berry, 2009). PCMs stated that effective weight management counseling and appropriate follow up took time that was not routinely available in the current primary appointment time setting. They also stated discomfort counseling patients about weight management due to lack of overweight and obesity management training (Barnes et al., 2014; Leverence et al., 2007). To prepare PCMs, this project included an educational module containing content about current practice guidelines and counseling strategies.

Diagnosis and Coding

Evidence suggested that PCMs fail to document overweight and obesity in the form of diagnosis or its corresponding ICD-10 code in the charts of their patients that meet the criteria (Barnes et al., 2014; Stephens, 2011). The trend continues despite interventions developed specifically to encourage providers to include the diagnosis (Barnes et al., 2014). With the advent of automated electronic health record prompts, researchers at a pediatric MTF found statistically significant improvement in the documentation of overweight and obesity (Bode et al., 2013). For this project, not only did the project MTF's EHR automatically calculate BMI, but the project participants responsible for collecting height and weight data, and diagnosis received regular email and in person reminders encouraging them to complete their documentation.

Provider Perceptions/Attitudes

Only about half of physicians feel they are qualified to treat obesity (Blackburn et al., 2015; Jay et al., 2009) due to lack of knowledge or training (Blackburn, Stathi, Keogh, & Eccleston, 2015) and personal, negative attitudes and biases about obesity. These issues may be barriers to PCM weight counseling (Jay et al., 2009). Nearly half of physicians surveyed by Jay and colleagues (2009) admitted to negative attitudes about a patient's overweight or obesity status and 54% in the same study did not feel they were successful with helping their patients with weight management. A survey of 620 physicians by Foster and colleagues (2003) reported that 1/3 of the respondents categorized obese patients as, "weak-willed, sloppy or lazy." While 75% agreed that a 10% weight loss had a positive impact on overall health, 40% responded that they did not believe that most patients would lose the recommended 10-15% of weight.

Perceptions of weight management counseling may be influenced by several PCM characteristics, including gender. Female PCMs were more positive about patient outcomes than

their male counterparts (p=0.007). The number of years since residency/training also had an effect on PCM counseling comfort levels, with newer providers more comfortable with weight counseling (Jay et al., 2009). Jay and colleagues posited that this may be due, in part, to changes in training curriculum that better incorporate weight management (Jay et al., 2009). Interestingly, 90% of military PCMs reported higher comfort levels with weight counseling and stated an, "obligation to counsel their patients" (Loomis et al., 2001 p. 122). They also reported lower negative attitudes and did not describe patients as, "lazy, sad, or lack self-control" (Loomis et al., 2001 p. 124). However, similar to their civilian counterparts, military PCMs did not find weight counseling to be, "professionally satisfying," and they voiced doubts about their patients' ability to obtain and maintain a healthy weight (Loomis et al., 2001). However, when compared to their civilian counterparts, military providers were actually more positive, 49% compared to 38% civilian, in the belief that their patients could achieve and maintain a healthy weight" (Loomis et al., 2001). To improve knowledge about weight management, this project included an education session developed from USAF and USPSTF guidelines.

Behavioral Health for Weight Management

The U.S. care medical model consistently focuses on the underlying pathophysiology of illness and disease, and largely ignores the social structures that influence or reinforce health behaviors (Annandale, 2014, p. 3-4). This may be especially true in obesity management. The medical model tends to look for a pathophysiological or internal reason for illness, where sociology examines the external reasons that affect and influence one's level of health or illness. Robert Straus defines sociology *in* medicine as, "collaborating with the medical specialist in trying to help him in the performance of his educational or therapeutic functions" (Straus, 1957,

p. 203). Strategies that combine both medical and sociologic approaches to care are thought to offer better opportunities to improve health outcomes for individuals.

Research noted that weight management that integrates behavioral health is an effective strategy and may overcome existing barriers (USPSTF, 2018; Wadden et al., 2014). The USAF established a behavioral health program specifically designed to promote a healthy lifestyle, including weight management. (*Practice Manual*, 2014). In 1997, the USAF conducted a two-year pilot study at Tinker Air Force Base (AFB) to examine the effect of integrating behavioral health into its MTFs. The behavioral health unit was comprised of a clinical health psychologist, clinical social worker, and a mental health technician (*Practice Manual*, 2014). One of the findings from this initial test was the need to ensure comprehensive training for behavioral health providers in integrated care as this approach is different from established mental health practices. The pilot program aimed to consistently provide care across all BHOP programs in the USAF. BHOP developers took note from the civilian sector where comprehensive training lead to a successful program (*Practice Manual*, 2014). By mid-2000, a working group comprised of psychology, psychiatry, and social work formed to develop the guidelines for behavioral health in primary care. The USAF undertook a second evaluation, selecting three additional pilot sites that included USAF psychology residency training programs (Andrews AFB, Wright Patterson AFB, and Lackland AFB) (*Practice Manual*, 2014). Two providers, a psychologist and social worker, were selected at each site. Training included both didactic and clinical experience. These providers became the initial "expert mentors/trainers" and trained approximately 20 psychology interns a year (Cummings, O'Donohue, & Ferguson, 2003, Chapter 7). Based on the success of the care model, as well as positive feedback from the initial clinics, ten additional MTFs were chosen for BHOP implementation. Site selection

occurred based upon the interest of social work and psychology providers, command support of the BHOP program, and the size of the MTF (*Practice Manual,* 2014). As each of these ten sites established their respective BHOPs, outcome measures including provider workload, types of services offered, and patient and provider satisfaction were observed (*Practice Manual,* 2014*).* Both patients and providers reported high satisfaction rates in the program, providers recommended continued program USAF wide (*Practice Manual,* 2014).

In 2006, a second working group was created to develop, "strategies to maintain fidelity to the BHOP model" (*Practice Manual*, 2014). Topics included training standardization, evaluating core competency, initiating a BHOP practice credential, and finally developing practice guidance for BHOP-primary care integration as a medical home component within the USAF" (*Practice Manual*, 2014). Final program design and practice guidelines were implemented in 2011. BHOP supports the Air Force medical system by integrating mental and behavior health into primary care in order to collaboratively address behavioral health issues such as overweight and obesity (*Practice Manual*, 2011, Chapter 1). The goal of this integration is to provide a collaborative effort without the need or perceived stigma of referring USAF personnel to mental health providers. Within weight management counseling sessions, there should be a discussion of behavioral changes. However, while PCMs state an understanding of the necessity of incorporating behavior changes, many fail to adequately provide counseling, citing a lack of time and training (Briscoe & Berry, 2009). In recognition of primary care providers' time constraints, the BHOP provider, as a consultant to PCMs, has both the time and the training to counsel patients on behavior modification to facilitate their weight loss journey.

BHOP providers address the non-medical aspect of weight management, such as behavior and lifestyle choices, including overeating and lack of or inconsistent exercise. Integrating

behavioral health with primary care for weight management improves both patient and provider satisfaction, as well as reduces healthcare costs (*Practice Manual*, 2014, p. 13). Further, by keeping BHOP services on-base and within primary care, there is improvement with patients' compliance, keeping appointments, and treatment follow up (*Practice Manual*, 2014).

A systematic review of 12 randomized control trials conducted by Wadden et al. (2014) found that integrated health programs were effective among overweight and obese patients. Landoll and colleagues (2017) found that USAF PCMs were aware of the BHOP program, but did not effectively utilize the service for their patients. Although PCMs in larger military treatment facilities (MTFs) (greater than 15,000 beneficiaries) reported greater perceived barriers to utilizing BHOP, such as unsure how to refer the patient, lack of time, or difficulty obtaining an available appointment. They were also more likely to suggest that the program was more helpful than those providers at smaller MTFs (Landoll et al., 2017). In general, all study PCMs reported that their regular 10-15 minute appointment did not provide adequate time for weight management counseling when added to the other chronic health issues that accompany obesity, and therefore, the topic of weight management is frequently not discussed. However, Wadden and colleagues (2014) noted that by working with behavioral health providers who often have longer appointment times, patient success was improved (Wadden et al., 2014).

Theory

Improving the diagnosis and treatment of overweight and obesity among USAF active duty members, and better utilizing the BHOP weight management program, requires behavior change on the part of clinic staff members. Changing staff behavior requires understanding why PCMs do not consistently utilize the BHOP program. For this project, the theory of planned behavior (TPB), a behavioral change theory (Montano & Kasprzyk, 2008) was used to understand the problem (for example, PCMs not utilizing an available weight management

program), as well as guide interventions (for example, appropriate interventions to increase the identification and documentation of overweight and obesity; provide patient counseling; and schedule patients to available weight management programs). TPB is an effective theory in the health-behavior area where goals of a behavior affect attitudes and intentions (Millstein, 1996).

Core Constructs

The theory of planned behavior has three constructs (Godin & Kok, 1996):

1. Attitude toward the specific behavior (Is the individuals' attitude toward the behavior positive or negative?). The level of intention is a measure of how much effort one is willing to give to perform the behavior (Ajzen, 1991, p. 181). Stronger intentions will result in more effort to perform the behavior. Intention requires purposeful choosing of an intended behavior. If a staff member has a strong intention to send overweight/obese active duty members for weight management, they will. In an example given by Rashidian and Russell (2011) in their study, the attitude by the provider of prescribing a statin (the action or behavior), may not be the same as the attitude toward CHD (the target of the action). In this example, the authors explained that while a provider is willing to prevent CHD, they may not be willing to prescribe a specific medication (Rashidian & Russell, 2011).
2. Subjective norms (How important is this behavior to those the individual deems important?). Subjective norms can best be described as peer pressure to either do or not do the specific behavior (Ajzen, 1991, p. 188). Will the staff members' peers (professionally) approve or disapprove of the behavior (Ajzen, 1991, p. 195)? If sending overweight or obese active duty members for weight management is important to the PCM, the med tech is more likely to follow through with the screening and scheduling the BHOP appointment. Historically, subjective norms

have the smallest impact on intentions when compared with attitudes and perceived behavioral control (Godin & Kok, 1996, p. 94). However, more recent literature that focuses on provider changes show that this construct may actually be a driving force to healthcare personnel behavior change (Godin, Belanger-Gravel, Eccles, & Grimshaw, 2008; Rashidian & Russell, 2011). Rashidian and Russell (2011) described a scenario where professional peer pressure (social norms) actually led to providers prescribing a more expensive statin. Providers in larger practices, and who are considered to be senior leaders, had a higher incidence of prescribing more expensive medications. However, if the provider worked in a CHD-specific population, or had a professional interest in the disease, they were more likely to prescribe a more cost-effective medication (Rashidian & Russell, 2011).

3. Perceived behavioral control (Does the individual feel they can perform the behavior and are there any barriers). Perceived behavioral control is influenced by one's perception of the action. If an action appears easy to accomplish and is barrier free, an individual is more likely to complete that action (Ajzen, 1991, p. 183). Therefore, if a PCM or med tech has control over a behavior or situation (perceived as accomplishable and barrier free), their intentions alone are enough to predict their behavior (Ajzen, 1991, p. 183). However, as voluntary control over a behavior decreases, for example as a result of barriers, the addition of *perceived* behavioral control becomes more useful. TPB proposes that behavior is the result of intention, and intentions are the result of one's attitude, subjective norms, and perceived behavioral control.

However, TPB does not assume that the person has complete voluntary control over a behavior and may also be influenced by outside conditions (e.g., presence or absence of enablers or barriers) (Ajzen (2006). For example, enablers may include guidelines such as those produced by the USPSTF, clinic policies and procedures, as well as education and training of staff on obesity counseling and management (Gunther, Guo, Sinfield, Rogers, & Baker, 2012). Barriers may include a lack of available services, or the knowledge of available services, clinical culture of quantity/production, and a lack of resources to assist both staff and patients with obesity management (Bornhoeft, 2018).

Theory Application to the Project

According to Fishbein and Capella (2006), when using a behavioral change theory such as TPB, there are four steps to changing a behavior (Fishbein & Cappella, 2006, p. S4-5):

1. Identify the behavior to be understood and changed. For this project, the desired behavior is to increase screening, diagnosis, counseling, and weight management appointment scheduling to BHOP for overweight and obese active duty members.
2. Understand that there are three parts to a behavior: the action (increased screening, diagnosing, counseling and scheduling), the target (overweight and obese AD member) and the context (current primary care clinic processes for overweight and obese patients). It is important to be mindful that changing any one part will change the behavior.
3. Once the behavior to be changed is determined, the theory can be used to measure beliefs, attitudes, norms, self-efficacy, intentions, and behavior. This step promotes understanding why PCMs, and subsequently med techs, may not follow recommended obesity guidelines by examining individual intentions. Perhaps the intention to act on this behavior is present; however, due to perceived barriers

(control beliefs), the intended behavior never occurs. Studies noted a number of barriers, including perceived lack of expertise in speaking to patients about weight, lack of quality time during the clinic visit, patient disinterest, or lack of BHOP appointment. It is during this step that investigators discover outside factors that influence clinic staff intentions (Fishbein & Cappella, 2006).

4. Identify differences in beliefs between staff members who follow the recommended guidelines and those who do not. Those beliefs will fall into the categories of behavioral beliefs, those that produce either a positive or negative *attitude*, normative beliefs, those that lead to the *subjective norm*, or control beliefs, those that lead to *perceived behavioral control* (Ajzen, 2006; Fishbein & Cappella, 2006). The *intention* of staff members is not always known. Some providers will have strong intentions toward the diagnosis and treatment of obesity, and therefore, are most likely already following DOD recommendations. Others will have little or no intention to follow the recommended course of action. Generally, when intentions are low, it is due to perceived barriers that staff find difficult to overcome, such as discomfort in discussing the topic, difficult to obtain timely BHOP appointments, or the patient is scheduled to deploy in the near future (Briscoe & Berry, 2009; Gunther et al., 2012).

Implementing behavior change is an active process that occurs based on either an internal, personal need (such as the need to begin an exercise routine), or an external motivation (such as a change in clinical guideline practices). Habit changes in a healthcare setting require terminating one, usually well-established behavior, while learning and incorporating a new one, often disrupting existing healthcare work flow (Gupta et al., 2017).

However, healthcare is a continuously evolving field that demands an ability to review, accept and implement new practice guidelines (Gupta et al., 2017). Recognizing and accepting the need for change is only the beginning of the cycle. Guidelines exist only to *guide* the practice, and often do not dictate how to integrate the guideline into one's practice (Gupta et al., 2017). While most health care professionals state they use evidence-based practice (EBP) in their clinics, Gupta et al. (2017) quoted one physician study participant:

> …very few of us are truly evidence-based. Most of us are snippet-based. Based off what you hear, what you read, what other people explain to you, what a mentor or somebody you really respect says. It's a mixture.

This statement can be applied to any provider type (Physician, NP, PA), including med techs employed at USAF MTFs. Understanding how clinical staff learn about guidelines aligns with TPB's subjective norms by recognizing that the degree to which a behavior is important to those the individual influences intentions (Ajzen, 1991). Casual, "off-line" conversations with one's peers, mentors, and colleagues may make it easier for healthcare personnel to change. Conversely, those who do not have immediate access to peer-to-peer consultation (for example, a single provider private practice) to discuss EBP changes, and instead must rely more on self-review and interpretation of the literature, may face more obstacles implementing recommended changes (Gupta et al., 2017). Among healthcare providers, subjective norm is the largest predictor of intention resulting in behavior change (Thompson-Leduc, Clayman, Turcotte, & Legare, 2014). Admittedly, studies note that changing the intentions and therefore the behavior of PCMs and staff members is difficult (Barnes et al., 2014), perhaps because a change in attitude and subjective norm does not guarantee a behavior change, especially if the perceived barriers are felt to be too much to overcome (Thompson-Leduc et al., 2014). While TPB may

not directly lead to habit changes in healthcare staff, its constructs of attitude, perceived behavioral control and most importantly, subjective norm can have an impact on the intention to change (Thompson-Leduc et al., 2014).

Although a common belief states that in order for a new action to be considered a habit, it must be consistently done for 30 days, there is no evidence support this claim. Lally and colleagues noted that the time necessary to either form or change a habit is contingent on several factors: readiness to change, complexity of the task (Lally, Van Jaarsveld, Potts, & Wardle, 2010), current guideline recommendations, and healthcare worker agreement with those guidelines as applied to their specific patient population (Gupta, Boland, & Aron, 2017). There are no set number of days a task must be repeated to become a habit. Time to habit formation ranged from 18 to 254 days, with a median of 66 days among participants engaged in adopting a self-determined health related behavior. Habit formation is a slow process that will develop based on specific cues, such as, "after breakfast, I will go for a walk," or, "at lunch every day, I will eat a piece of fruit" (Lally et al., 2010). When these actions are repeated, there is a connection formed between the situation and response (Carden & Wood, 2018).

For this project, the desired behavior was that the clinic staff will identify overweight and obese AD members via screening, documenting a diagnosis, briefly counseling the patient, and scheduling the patient for BHOP weight management. Next is defining the population for the behavior change (Ajzen, 2006). In this project, the target populations were both PCMs and med techs from a single primary care USAF MTF. The final aspect of information gathering is eliciting salient beliefs (Ajzen, 2006).

CHAPTER 2: METHODS

This quality improvement project used a pre-post design to evaluate PCMs' and med techs' adherence to a patient screening and service access protocol designed to improve consistent screening, diagnosis, counseling, and appointment scheduling of obese active duty USAF personnel at a USAF primary care MTF. To assess the effectiveness of the intervention, EHR data related to weight data entry, diagnosis, counseling, and appointment scheduling were captured four weeks prior to, during, and four weeks following the implementation period.

Project Setting

The MTF, located within a central Georgia USAF base, was also home to the Georgia National Guard. The MTF included two practice groups or clinics (primary care and flight medicine), as well as three specialty services (women's health, pediatrics, and BHOP). The MTF served approximately 10,500 beneficiaries and conducted approximately 22,000 patient visits a year. At the time of the project, empanelled patients included all active duty members and their families, activated National Guard, as well as a large retiree population. The MTF operated Monday through Friday from 7:30 am to 4:30 pm. Patients had access to a nurse advice line and an on-call provider when the clinic was closed.

Subjects

The family practice clinic consisted of two physician-led teams, with three physicians, four nurse practitioners, four physician assistants, five nurses, and at least one medical technician assigned to each provider. The single flight medicine team consisted of three physicians, three flight surgeons (who divide their time between clinic and non-clinic duties), four independent duty medical technicians (IDMT) and at least one med tech per provider. Guided by protocols,

both clinics provided a select set of walk-in services (for example, blood pressure checks, UTI checks, suture removals, and birth control injections) through use of non-licensed personnel. Four IDMT in-flight medicine and five medical technicians, as well as three RNs and one LPN in primary care, performed these services.

Screening and Service Access Protocol Development

Based upon USPSTF and USAF guidelines, as well as PI experience as a USAF primary care provider, the PI created the following draft screening and service access protocol:

1. Med tech: measure and record patients' height and weight using available instrumentation; subtract seven pounds if patients wear a service uniform and boots, or three pounds if patients wear a physical training uniform; verbally provide EHR-generated BMI to provider; and notify provider of patients with BMI $\geq$ 25, and if BMI $\geq$ 30; remind provider that patient qualifies for the BHOP weight management class.
2. Providers: enter appropriate diagnosis codes in the EHR; initiate a brief discussion (counseling) that includes recommending enrollment into the BHOP weight management program; and document this counseling in the EHR.
3. Providers: enter a referral via the EHR system to the BHOP RN.
4. BHOP RN: contact the AD member within 72 hours to schedule them for the next available BHOP small group weight management class.

Evaluating Practice Change

EHR data were collected to assess the impact of the project on screening, diagnosis, counseling and appointment scheduling of obese patients, as this was the target selected by MTF stakeholders. The following data elements existed within the EHR either as discrete fields or in clinical notes: height, weight, BMI, obesity diagnosis codes, provider counseling, and BHOP

weight management appointments (Table 1). Using EHR queries, an active duty patient list was generated to guide a manual review of each patient's EHR appointment documentation. Data were collected in four time periods: pre-implementation, half way through the implementation period (Week 4), at the conclusion of the implementation period (Week 8), and four weeks post-implementation.

To assess staff response to the intervention, data were compared from baseline (pre-implementation data) to time points two, three (implementation phase), and four (post-implementation data) using repeated measures logistic regression. SAS version 9.4 (SAS Institute, Cary, NC) was used for data analysis, level of significance $p \leq 0.05$.

Table 1

Evaluation Data Collection Plan

	Data Source	Measure
Med Tech Performance	EMR	Number of medical records with height and weight recorded/number of patients screened
	EMR	Number of records with correct corresponding diagnosis code/number of medical records with BMI ≥25 (overweight) or ≥30 (obese)
Provider/Med Tech Performance	EMR	Number of obese patients with documented weight management counseling/ number of medical records with BMI ≥25 (overweight) or ≥30 (obese)
	EMR-CHCS	Number of patients scheduled (i.e. enrolled in the program) with BHOP/ number of medical records with BMI ≥25 (overweight) or ≥30 (obese)

Implementation Strategies

Following University of North Carolina institutional review board approval and obtaining support from MTF leadership, the project was conducted in three phases.

Pre-Implementation

In this phase the PI spoke with clinic leaders and team members in an informal setting. The PI planned to directly observe med techs' height and weight assessments. However, because this activity was performed within individual treatment rooms and could not be observed discreetly, direct observation did not occur. The PI formally introduced the project through an educational session (Appendix A). Following the presentation, the care teams were invited to provide feedback about the draft screening and service access protocol; clarify current clinic practices related to height and weight data collection; height and weight status communication between med techs and providers; and level of BHOP weight management program use. Based upon this feedback, the screening and service access protocol was then revised to align counseling and appointing activities with existing clinical work flow and to only target obese patients (Appendix B).

Implementation

Project implementation took place over eight weeks and used the following strategies: employed a project champion; developed a printed BMI decision guide; conducted bi-weekly face to face problem solving with teams; and sent bi-weekly email reminders (Table 2).

Table 2

Implementation Period Support Strategies

Week	1	2	3	4	5	6	7	8
Project Champion	X	X	X	X	X	X	X	X
BMI Decision Guide	X	X	X	X	X	X	X	X
Face-to-Face	X		X		X		X	
Email Reminders		X		X		X		X

Champion. The Flight Commander for family practice selected a qualified, respected med tech to serve as champion. In flight medicine, the flight surgeon (a physician and an officer) who approached the PI to request that the team be included in the project volunteered to serve as champion for that group. The champions received a detailed review of project goals, strategies, timeline, and duties and responsibilities. Face-to-face discussions occurred bi-weekly, and the PI was available any time by email to answer questions. The champion answered staff questions and collected feedback from participants, especially from the med techs, who because of rank differences, may have hesitated to communicate directly with the PI.

BMI Decision Guide. A printed BMI Decision Guide, or "cheat sheet" describing care actions for each BMI category (Appendix C) was placed in each patient treatment room to serve as a reference for care team members.

Face-to-face reminders. Face-to-face reminders to care team members were conducted during implementation weeks 1, 3, 5, and 7, during which the PI answered questions and identified and resolved implementation barriers.

Email reminders. Emails sent to care team members during implementation weeks 2, 4, 6, and 8 reminded MTF members about the project, encouraged question submission, and provided point of contact information for the onsite champion and for the PI (Appendix D).

Post-Implementation

Originally the PI planned to collect and analyze data every two weeks in order to provide frequent feedback to participants. However, the PI encountered significant delays in receiving permission to access EHR records for manual review. MTF care team member performance data were collected four weeks pre-implementation, after eight weeks of implementation, and four weeks after the implementation period.

CHAPTER 3: RESULTS

Protocol Changes

In response to the education session and proposed draft protocol, providers requested that med techs first initiate the discussion with patients immediately following height and weight assessments. Unfortunately, MTF leaders informed the PI that the BHOP RN could not be used for administrative purposes, such as initiating the weight management conversation or scheduling patients for the BHOP class. Therefore, providers recommended that med techs also make BHOP appointments for patients because they had access to this EHR function. Finally, providers requested that the protocol focus on patients ≥30 BMI as they believed this population might be most motivated to utilize BHOP services and were supported by an existing clinic clinical pathway. During the Week 3 PI visit, the project champion reported that med techs had difficulty initiating the weight management discussion with patients. Specific reasons for this difficulty were not shared with the PI. It is possible that it was due to their lack of training, experience, and comfort in discussing this sensitive topic with higher-ranking members. Therefore, the PI provided a template to guide future weight related conversation (Appendix E).

Adherence to Screening and Service Access Protocol

Family Practice

Family practice staff saw a total of 1,184 Active Duty patients during the entire project period (Table 3). Documentation of height, weight, and BMI started high (100%) and remained high throughout the implementation and post-implementation periods. Diagnosis documentation remained similar to pre-implementation levels (approximately 1/3 of all obese patients had an

appropriate diagnosis) at Time 2, but then fell and was statistically significantly lower (32.4% vs 11.8%) at post-implementation (p=0.0032, 7.9-17.9 (95% CI)). Similarly, initiating and documenting weight management conversations fell significantly at Time 3 (26.5% vs 6.9%, p =0.0143, 3.8-17.3 (95% CI)) and remained statistically significantly lower at Time 4 (10%, p =0. .0152, 6.9-16.6 (95% CI)). Although the BHOP post-implementation appointment rate was nearly twice the pre-implementation rate, this change was not significant.

Flight Medicine

Flight medicine saw 314 active duty patients during the project period (Time 1 to Time 4). Documentation of height, weight, and BMI was 79.2% at Time 1 and rose to its highest (98.1%) at Time 3, although this improvement was not significant or sustained through the post implementation period. Documentation of obesity diagnoses was low at pre-implementation (13.3%) and decreased to 7.4% post-implementation, this change was not statistically significant (p= 0.8352, 21.2, 56.2 (CI=95%)). Initiating weight management conversations showed a pre-to-post increase (13.3% to 25.9%), but again, there was no statistically significant difference (p= 0.3997, 12.9, 45.3 (CI=95%)). Finally, scheduling obese active duty members with BHOP had an increase (0.0% to 22.2%) before declining back to 0.0% (p= 1.00, 0.0, 100.0 (CI=95%)).

Medical Technicians, IDMTs, Nurses

This group consists of staff members from both family practice and flight medicine. A total of 133 active duty members were seen by this group. The only category that could be effectively analyzed was the height weight and BMI. This category started high, with a decrease in the post-implementation phase (90.9% to 77.4%), but again there was no statistically significant difference. The numbers in the remaining three categories were too small to support proper analysis.

Table 3

Family Practice Active Duty Patients: Screened, Diagnosed, Counseled and Appointed

	T1	T2	T3	T4	T1 vs. T2	T1 vs. T3	T1 vs. T4
	Pre n (%)	Implementation Weeks 1-4 n (%) (95% CI)	Implementation Weeks 5-8 n (%) (95% CI)	Post n (%) (95% CI)	Pre vs. Implementation Weeks 1-4	Pre vs. Implementation Weeks 5-8	Pre vs. Post
Total AD Patients Seen	161	149	268	606			
Height/ Weight/BMI	161 (100.0) (0.0, 100.0)	147 (98.7) (94.9, 99.7)	265 (98.9) (96.6, 99.6)	598 (98.7) (97.4, 99.3)	p=0.9998	p=0.9998	p=0.9998
# Obese	34	36	72	170			
Obesity Diagnosis in chart	11 (32.4) (19.5, 50.8)	11 (30.5) (18.9, 49.5)	12 (16.7) (9.7, 27.1)	20 (11.8) (7.9, 17.9)	p=0.9319	p=0.0595	p=0.0032
Conversation Initiated	9 (26.5) (14.8, 44.7)	7 (19.4) (14.4, 43.5)	5 (6.9) (3.8, 17.3)	17 (10) (6.9, 16.6)	p=0.9410	p=0.0143	p=0.0152
BHOP appointment made	1 (2.9) (0.4, 19.1)	4 (11.1) (4.5, 27.5)	3 (4.2) (1.3, 12.0)	10 (5.9) (3.3, 10.9)	p=0.2160	p=0.8089	p=0.5160

Table 4

Flight Medicine Active Duty Patients: Screened, Diagnosed, Counseled and Appointed

	T1	T2	T3	T4	T1 vs. T2	T1 vs. T3	T1 vs. T4
	Pre n (%)	Implementation Weeks 1-4 n (%) (95% CI)	Implementation Weeks 5-8 n (%) (95% CI)	Post n (%) (95% CI)	Pre vs. Implementation Weeks 1-4	Pre vs. Implementation Weeks 5-8	Pre vs. Post
Total AD Patients Seen	53	49	107	105			
Height/ Weight/BMI	42 (79.2) (66.3, 88.1)	41 (84.0) (71.1, 91.8)	105 (98.1) (92.6, 99.5)	92 (87.6) (81.9, 91.7)	p=0.5350	p=0.0010	p=0.1293
# Obese	15	9	17	27			
Obesity Diagnosis in chart	2 (13.3) (3.6, 42.7)	2 (22.2) (5.6, 57.9)	2 (11.8) (3.0, 36.8)	2 (7.4) (21.2, 56.2)	p=0.6264	p=0.8352	p=0.1432
Conversation Initiated	2 (13.3) (3.6, 42.7)	1 (11.1) (1.5, 50.0)	2 (11.8) (0.8, 32.0)	7 (25.9) (12.9, 45.3)	p=0.8258	p=0.4445	p=0.3997
BHOP appointment made	0 (0.0) (0.0, 100.0)	2 (22.2) (1.5, 50.0)	3 (17.65) (3.1, 38.6)	0 (0.0) (0.0, 100.0)	p=0.9999	p=0.9999	p=1.0000

Table 5

Medical Technicians/IDMTs Active Duty Patients: Screened, Diagnosed, Counseled and Appointed

	T1	T2	T3	T4	T1 vs. T2	T1 vs. T3	T1 vs. T4
	Pre n (%)	Implementation Weeks 1-4 n (%) (95% CI)	Implementation Weeks 5-8 n (%) (95% CI)	Post n (%) (95% CI)	Pre vs. Implementation Weeks 1-4	Pre vs. Implementation Weeks 5-8	Pre vs. Post
Total AD Patients Seen	22	30	32	49			
Height/ Weight/BMI	(90.9) (70.0, 97.7)	(92.9) (75.5, 98.2)	(84.4) (67.5, 93.3)	(77.4) (64.2, 86.7)	p=0.8014	p=0.4873	p=0.1854
# Obese	7	3	6	4			
Obesity	0	0	1	0	*	*	*
Diagnosis in chart							
Conversation Initiated	0	0	1	0	*	*	*
BHOP appointment made	0	0	1	0	*	*	*

CHAPTER 4: DISCUSSION

In this study, the PI evaluated adherence to a newly designed screening and service access protocol across PCMs, medical technicians/IDMTs, and nurses in a single USAF primary care MTF using a pre-post design. Appropriate assessment and documentation of height, weight, and BMI remained consistently high throughout the project period. Not only did the project demonstrate no improvement in diagnosis, patient counseling, and BHOP appointments, the rates of each of these activities declined, in some cases significantly. In light of the USPSTF guideline recommendations and the military's emphasis on fitness for duty, the abnormally low rates for diagnosis, counseling and weight management should be of major concern for the USAF.

BMI is a standard measurement used by clinicians as a screening tool to determine if a patient is overweight or obese. Including the BMI in EHR data used during patient encounters was effective in improving providers' patient obesity documentation (Bode et al., 2013). In this project, family practice began with and sustained a high rate of BMI documentation. Although there is always room for improvement, overall this team performed well. Meanwhile, with flight medicine (80%-90%) and medical technicians/IDMT/nurses (77.45 – 92.9%), performance was lower. Among flight medicine patients, this difference may be due to flight medicine's responsibility for completing annual physical health assessments (PHA) and flight physicals on all active duty members. Height and weight are not required for this assessment; therefore, providers and med techs did not measure patient height and weight, preventing automatic calculation of BMI. This represented a missed opportunity to identify overweight and obese

active duty members. The med techs /IDMTs/nurses had the lowest percentage for recorded BMI, with a pre-implementation rate of 78% and post-implementation rate of 93%. These staff members were responsible for walk-in procedures such as birth control injections, UTI testing, and suture removal. In general, these patients did not see a provider unless the care protocol indicated a need. Although these visits may not be viewed as a traditional clinic visit, it was still an opportunity to screen for weight issues. While 100% compliance with BMI documentation is the goal, overall the MTF demonstrated that this was already being consistently performed. However, flight medicine may want to consider entering the height and weight for all PHAs and flight physicals in order to screen BMI, and therefore identify obesity more consistently. This change would create an annual opportunity for weight evaluation.

Proper documentation of an obesity diagnosis is an important step in the process of supporting active duty members' weight management. For family practice and flight medicine, there was no statistical difference in the pre- and post-implementation time periods. For family practice, the rate steadily decreased from 32% at pre-implementation to 12% in the post-implementation phase. It is unknown *why* this occurred. It is likely that the revised version placed too great a responsibility on the med techs and required them to document an obesity diagnosis and initiate a weight management conversation with patients. While these activities might better align with existing clinical workflow (that is, discussing weight at the time weight is assessed), lack of training and experience initiating conversation with patients who likely outrank the med tech may have been a barrier to completing this activity. In the early stages of the implementation, flight medicine improved briefly from 13% to 22% from Time 1 to Time 2; however, this improvement was not sustained. Again, PHAs may be a factor in these results. If height and weight are not obtained, then the BMI cannot be calculated, which prevents a

provider from properly diagnosing overweight or obesity. The third group (med techs/IDMT/nurses) had insufficient diagnosis, counseling, and appointment data for analysis, perhaps because patients participating in this type of clinic visit did not routinely see a provider, the individual normally responsible for making an overweight/obese diagnosis. Efforts to improve diagnosis documentation have had varying degrees of effectiveness. Bode et al. (2013) increased the documentation of overweight or obesity from 40% to 64% utilizing an electronic "pop-up notification" within the EMR. In a study by Gangadhar et al. (2018), the test group improved documentation by 1.24%, compared to the control groups 0.29%, when pop-up prompts were displayed for BMI $\geq$25 or $\geq$30. The test group was also more likely to document a follow-up plan compared to those providers in the control group. However, an intervention by Barnes and associates (2014) did not show statistical improvement despite weekly reminders cards to providers in their office mailboxes. This intervention showed similar results in that consistent verbal and email reminders appeared to have less impact than a "pop-up" notification system. This step should be an item of focus in future interventions. Consistent documentation of an obesity diagnosis may encourage provider-led discussion of weight management with patients.

Weight management counseling, even if done only briefly, can have a significant impact on patient weight loss (Aveyard et al., 2016). The family practice group's counseling documentation fell throughout the implementation period from a baseline of 26.5% to 10% post-implementation. There was a slight improvement in the counseling rate from Week 3 to Week 5, which coincided with the med techs' access to the script, provided to assist with initiating weight conversations. Flight medicine, although not statistically significant, did have an increase from 13% to 26% pre- to post-implementation. From Time 1 to Time2, there was a decrease in the

rate. During the Week 3 PI site visit, the flight medicine champion shared that front desk staff was tasked with initiating the conversation and scheduling qualifying active duty members to BHOP. Similar to med tech discomfort with initiating weight conversations with patients, it is likely that front desk staff also experienced difficulty. This deviation from the agreed upon protocol may account for the decrease. The PI emphasized the importance of privacy with the flight medicine champion, and requested that initial weight conversations be conducted by the med tech in the exam room. In response, the counseling rate improved in Times 3 and 4. The IDMT, or walk-in appointment group, did not have sufficient data for analysis, likely because of the lack of provider involvement in these patient visits. During a PI post-implementation data collection visit, a senior med tech shared that failed weight assessment and BMI calculation during walk-in appointments was a missed opportunity to identify overweight and obese patients. Results from this project are similar to published findings of other studies examining providers' weight management counseling (Kraschnewski et al., 2013). The barriers to patient weight management counseling are well documented and include lack of training, lack of appointment time, and provider discomfort. Although med techs did receive a script to assist them in discussing weight management with patients, it may be that this aid was insufficient to overcome their hesitation. Initiating a weight management discussion with patients may be further hampered by rank structure differences between med techs (enlisted, lower-rank, and likely younger) and patients (enlisted and officers, likely higher rank, and likely older). Understanding about the influence of rank on important yet uncomfortable topics requires further study in order to identify and mitigate barriers to performing this task in other MTFs. Better training, and perhaps practice, might assist both providers and technicians in effectively and efficiently approaching patients about weight.

The final category in this project was to schedule the obese active duty member to the BHOP weight management program. Optimally, this would be done by the technician prior to the provider entering the room, contingent upon the patient's agreement. The MTF providers believed that because med techs had access to the EHR appointment function, appointments made by med techs at the time of the appointment or immediately following, would improve compliance. The family practice group, while not statistically significant (p= 0.5160) did show an increase from pre-implementation (3% up to 11%) in the early implementation phase, before decreasing back down to 6% in the post-implementation phase. While there was some improvement in the appointment rate, it appears that many military-specific issues created barriers that could not be overcome through the current project design. Flight medicine started at 0% appointment in the pre-implementation phase, increased to 22% in the early implementation phase, but then drastically fell back to 0% in the post phase. At Week 5, the PI became aware of an alternative weight management program, Better Body program, offered by the health and wellness center. The flight medicine champion indicated that this team's patients appeared to prefer the Better Body program over the BHOP program. Because the project was well underway, the PI requested that flight medicine continue to offer BHOP appointments, following the established protocol. It may be that patients perceived fewer stigmas with the Better Body versus 'behavioral health,' which warrants further follow up. Both the Better Body program and the BHOP weight management program have effective results, and *both* could be utilized either individually or even simultaneously. The walk-in group did not have enough data for adequate analysis.

The USPSTF guidelines recommend behavior-based counseling for weight management (U.S. Preventative Services Task Force, 2018). While gathering data from the EHR, the PI

noticed several instances where a provider documented a patient's refusal for a BHOP weight management appointment quoting the patient, "did not believe their weight was an issue," despite a BMI > 30. A systematic review conducted by Wadden et al. (2014) also demonstrated that utilizing a trained behavioral or integrated health provider led to greater patient weight loss, and was maintained through month 24. Therefore, utilizing the USAF BHOP will likely reduce overweight and obesity rates once patients engage with the BHOP program.

Strengths and Weaknesses

Increasingly, DoD leaders view active duty members' health and fitness as crucial to military success, so much so that a recently published Department of Defense memorandum recommends removing members from active service if they remain undeployable for 12 months due to health and fitness causes. These changes encouraged military leaders to implement stronger recommendations for healthy weight and fitness levels. This project built upon the growing emphasis on healthy weight and fitness, and the existing capacity within the MTF's BHOP program and functions within the EHR to automatically calculate BMI and appoint patients to BHOP. Evidence-based implementation strategies included employing a champion, engaging with stakeholders, and using a reminder system.

Weaknesses

Care teams determined that med techs should both document the diagnosis and initiate the conversation about weight management with the patient in order to provide the smoothest workflow. However, med techs found it difficult to initiate these conversations, perhaps because of hierarchal differences in rank. Future projects should consider provider influence on patient behavior as it may be more likely that patients will respond to provider recommendations. Secondly, while having a project champion is generally an effective strategy, in this case, having a family practice champion of lower rank may have reduced their influence on higher ranking

team members. Future projects should consider peer champions for each type of provider involved. Finally, although the original project plan included providing numeric evaluation as feedback to each team, delays in PI access to the EHR prevented this important and well established strategy effecting provider behavior change.

Based on study results from Bode et al. (2013), and Gandahar et al. (2018), it is very likely that a "pop-up" EHR notification system may be effective in improving the documentation of overweight and obesity. Although this was not an option for this project, this type of notification could easily be incorporated into the current and future EHR systems used by the USAF.

Future projects should avoid placing the majority of the responsibility on med techs despite the ease of integration with existing workflow. Although med techs expressed a willingness to initiate the conversation, due to the hierarchal system of the military, it would appear that med techs were not as comfortable as initiating this type of conversation with patients. Both higher rank and older age may have served as a barrier. Future projects should focus on the conversation coming from the provider.

However, if the provider initiates these conversations, the original issue of process flow may resurface. MTF providers do not have access to the EHR appointment process and may have insufficient time during the health care appointment to accomplish this task. Future projects may want to consider utilizing the disease management RNs. There is a referral system already in place, and disease management RNs are already familiar with preventive medicine techniques. These specially trained RNs can easily call patients, close the loop on the initial weight management conversation, and schedule the patients with the BHOP program.

Finally, in a military setting, I recommend having both an officer and an enlisted champion for better communication. Officers are not going to approach an enlisted member with a concern. Enlisted members are more likely to approach an officer with a question or even a suggestion, but would most likely prefer a champion that is a "peer" to communicate with.

Implications

This project highlighted the difficulty of achieving care provider change. In this project, MTF members care behaviors remained largely unchanged despite the evidence that overweight and obesity are a leading cause of multiple comorbidities, and that by screening, documenting, and addressing the issue, many of those comorbidities could be reduced or even eliminated (Reyes-Guzman et al., 2015; Rush et al., 2016). To improve MTF healthcare provider performance, this project employed a stakeholder-driven screening and service access protocol and used evidence-based strategies to support behavior change. Lack of change may suggest that other underlying barriers exist that were not overcome by project methods, suggesting the need for further research. Barriers include rank and age differences, the inexperience of the med techs in initiating this type of conversation, and, perhaps, a lack of provider motivation to make the behavior change. During the project implementation, the start of a new fiscal year occurred, and with it the Department of Health and Human Services (HHS) took over the management of the military medicine system. This was a time of additional stress for DoD medical facilities, and therefore providers and staff who would have normally been more amenable to this type of project were most likely more focused on learning the new expectations required by HHS than on a screening and service access protocol change.

Further, while active duty members are encouraged to follow the recommendations for weight management given to them by their provider, acceptance of the BHOP appointment or attending the classes are not mandatory and can be refused at any time, even if BMI and other

health risks indicate the member would benefit from weight loss. However, with overweight and obesity steadily becoming more prevalent within the ranks, it may become necessary for the USAF to consider making weight management mandatory, both for providers to document and counsel, as well as active duty members to follow through with recommendations such as the BHOP weight management program.

Conclusions

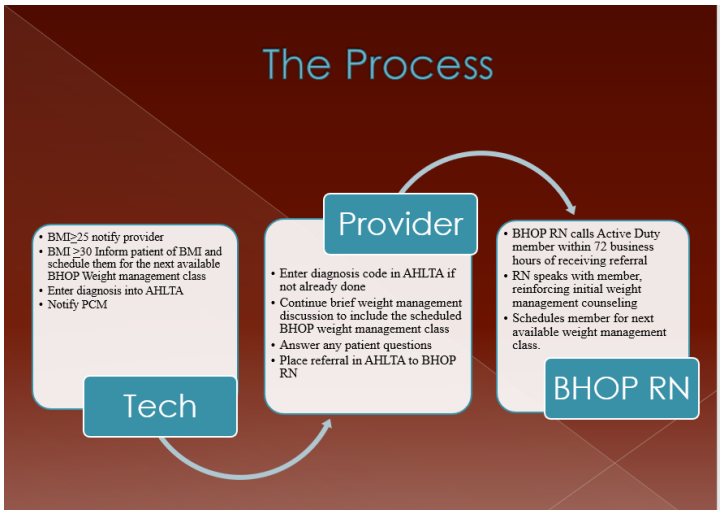
Changing provider and staff behavior is difficult. While the research evidence demonstrated that behavioral health is an effective method for weight loss, the difficulty in changing provider overweight and obesity screening, diagnosis, and counseling behaviors remain a significant barrier to assisting patients in address this significant health issue. Identifying and addressing unique barriers in the military setting is a must. Although no significant change occurred during the project period, the lessons learned will prove valuable to future interventions.

APPENDIX A: WEIGHT MANAGED EDUCATION OUTLINE

- Weight Management in the U.S. Air Force
  - Julie A. Thomas, Major, USAF, NC
  - AFIT DNP Student
  - University of North Carolina, Chapel Hill
- The Problem is…..
  - 60% of active duty members are either overweight or obese
  - In the U.S. Air Force, 50% were overweight, 22% were obese in 2008
  - PCMs are not consistently diagnosing and coding overweight and obesity
- Negative Impact on USAF mission
  - Negative impact of weight
    - Risk of comorbidities
      - HTN, DM, sleep apnea, MH conditions
    - Affects job performance
      - Absences
      - Chronic pain limiting mobility/physical job demands
      - Depression
    - Impact on Airman's career
  - DoD changes (Feb 2018)
    - Deployment status
      - 12 months of non-deployable = Administrative/medical discharge
- Patient-Provider Discussion
  - Patient-Provider discussion has a positive impact on patient weight loss
    - Patients are more likely to self-report a 5-10% weight loss over the next year
      - 14% of subjects lost 5% of body weight
      - 6% lost 10%
  - Initiating weight counseling *and* referring patients to weight management
    - Results double
      - 25% lost 5%
      - 12% lost 10%
- However…
  - PCMs are not addressing patients' weight
    - Not consistently diagnosing/coding
  - Weight management programs by BHOP
    - Not consistently utilized by PCMs
  - Appropriate and consistent diagnosis is critical for this intervention
    - If it's not diagnosed, how can you justify the recommendation?

- USPSTF Obesity Management Recommendations
  - Screen all patients for obesity
  - Intensive, multicomponent behavioral interventions for obese adults.
    - Behavioral management activities
      - i.e.: Weight loss goals
    - Improving diet/exercise routines
    - Addressing barriers to change
    - Self-monitoring
  - USPSTF determined there is adequate evidence for behavioral interventions resulting in an average weight loss of 4-7 kg (8.8-15.4 pounds)
- Obesity Guidelines
  - Current DoD guidelines recommend PCMs review a patient's weight/BMI annually
    - Annual PHA
  - PCMs not following recommended guidelines
    - Lack of adequate appointment time
    - Provider discomfort
    - Diagnosis priorities
- Military vs. Civilian Providers
  - Military providers state a higher comfort level
  - Military providers are more likely to state an "obligation to counsel"
  - Military providers report lower negative attitudes/descriptions
  - Military voice more positive outlook on patient success than civilian counterparts
    - 49% compared to 38%
- Diagnosing and Coding
  - Overweight and obesity are not being documented/coded
  - Bode et al. (2013) found that EMR prompts at an MTF significantly improved documenting overweight and obesity
- Behavioral Health for Weight Management
  - Weight management integrated with behavioral health is an effective strategy
    - Wadden et al. (2014) Systematic Review
      - Showed that when PCMs and BH providers work together, patient success improves
  - USAF BHOP has an established weight management program
    - PCMs are aware of the program, but not effectively utilizing.
      - Providers state/admit that a 10-15 minute appointment is not adequate for effective weight management
      - However, BHOP providers do have longer appointment times

- Why focus on Weight Management?
  - Modest weight loss
    - 5-10% weight loss showed significant improvements in CVD
      - Lower blood sugar levels
      - Lower blood pressure
      - HDL cholesterol
      - Triglycerides
  - Higher amounts of weight loss
    - Even more improvements!
  - By improving the patient's weight, we can subsequently improve other comorbidities
- The Process



- When does this start?
  - Friday, August 17, 2018
  - Will run for 8 weeks
    - I will be here every other week to check in and be available as needed.
    - Reminder emails
    - Updates on productivity
  - There will be a final data check 4 weeks after completion to see if the project was effective.
- Proposed Project Timeline and Strategies

Week 1 8/15/2018	Introduce the project to each group of stakeholders involved • Providers • Med Techs • BHOP Provider/RN Conduct pre-implementation data collection
Week 2 8/20/2018	Begin project implementation • Be available on site/in clinic to answer questions, provide resources, etc • Check-in with participants during huddle group
Week 3 8/27/2018	Reminder email Monday to providers and med techs • Feedback from participants
Week 4 9/3/2018	Reminder email Monday • Present practice change to new staff members if needed • Available on unit for questions, concerns or suggestions • Huddle group
Week 5 9/10/2018	Reminder email Monday • Feedback from participants • Communicate with BHOP provider to see if there has been an increase noted in scheduled appointments
Week 6 9/17/2018	Reminder email Monday • Present practice change to new staff members if needed • Available on unit for questions, concerns or suggestions • Huddle group
Week 7 9/24/2018	Reminder email Monday • Feedback from participants
Week 8 10/1/2018	Reminder email Monday • Present practice change to new staff members if needed • Available on unit for questions, concerns or suggestions • Huddle group
Week 9 10/8/2018	Reminder email Monday • Final feedback from participants • Discuss pros/cons of the new process
Week 13 11/5/2018	Obtain post-implementation data

- Expected Outcomes
  - Providers will improve in consistently documenting the diagnosis of overweight and obesity and initiating weight counseling
  - Providers will consistently refer overweight and obese active duty members for weight management.
  - Active Duty members will be scheduled an initial appointment to the BHOP weight management class

APPENDIX B: PROPOSED VERSUS FINAL SCREENING AND SERVICE ACCESS PROTOCOL

Original Protocol	Revised Protocol after Stakeholder Feedback
Assessment	
Med Tech: measure and record patients' height and weight using available instrumentation; subtract seven pounds if patients wear a service uniform and boots, or three pounds if patients wear a physical training uniform; verbally provide EHR-generated BMI to provider; and notify provider of patients with BMI $\geq$ 25, and if BMI $\geq$ 30; remind provider that patient qualifies for the BHOP weight management class.	**Med Tech**: measure and record patients' height and weight using available instrumentation; subtract seven pounds if patients wear a service uniform and boots, or three pounds if patients wear a physical training uniform; If patient BMI$\geq$ 30, inform them of BMI calculation, and initiate discussion, and schedule patient for next available BHOP weight management class. Verbally provide EHR-generated BMI $\geq$ 30 to provider; Remind provider that patient qualifies for the BHOP weight management class, and if they were/were not scheduled already.
Diagnosis	
Providers: enter appropriate diagnosis codes in the EHR; initiate a brief discussion (counseling) that includes recommending enrollment into the BHOP weight management program; and document this counseling in the EHR.	**Med Tech:** If patient BMI$\geq$ 30, enter a diagnosis code in the EHR. **Providers**: enter appropriate diagnosis codes in the EHR; If med tech reported that AD member was hesitant or refusing BHOP appointment, provider should give additional counseling and recommend enrollment into the BHOP weight management program; and document this counseling in the EHR.
Initiate Counseling Discussion	
Providers: enter a referral via the EHR system to the BHOP RN.	**Med Tech**: If patient BMI$\geq$ 30, inform them of BMI calculation, and initiate discussion, and schedule patient for next available BHOP weight management class.
Appoint to BHOP	
BHOP RN: contact the AD member within 72 hours to schedule them for the next available BHOP small group weight management class.	**Med Tech**: If patient BMI$\geq$ 30, schedule patient for next available BHOP weight management class.

APPENDIX C: SCREENING AND SERVICE ACCESS PROTOCOL DECISION GUIDE

Obesity, Unspecified E66.9
Overweight E66.3

BMI 20-29 Z68.2
BMI 30-39 Z68.3
BMI >40 Z68.4

BMI $\geq$ 25
Notify Provider

BMI $\geq$ 30
Initiate Weight Management Counseling
Schedule patient for next available BHOP class
Notify Provider

APPENDIX D: PROJECT EMAILS TO PARTICIPATING CLINICS

Week 2

It's been a week since starting new weight management scheduling of our active duty members. How's it going? Any questions? Airman Poirier in Family Health is my Champion when I can't be there. If she doesn't know the answer, she'll contact me! I will be back at the clinic 4 September.

Any thoughts on this process? Suggestions? I'm open to your thoughts or recommendations. Med Techs: You are the first line of this new process. Please remember to take note of the BMI. If it's greater than 25, give your provider a heads up so they can initiate that conversation. If they are over 30, go ahead and get them scheduled with BHOP.
Providers: You can close that loop by finishing up the brief weight management counseling started by your Tech, and answering any questions. Don't forget to encourage them to keep the scheduled appointment!
Thank you again for all your help with this. I feel this is a positive step towards improving the health of our Airmen!

Week 4

We are entering Week 4 for the process change of getting our active duty airmen who qualify into our BHOP weight management program. Hopefully, at this point, you have found your "groove"! I am sending Airman Crumb a template for the techs that would like some guidance on initiating that conversation. Also, as discussed, I'm sending a simple template that if it is decided that it is currently NOT in the patient's best interest to discuss weight management, you can write down pt name, last four, and why the conversation wasn't initiated (for example: 9/12/18 White, Snow -2020, Pt seen for anxiety/depression, score=23.)

I was hoping to have numbers for you during my last visit, but our new GPM has just recently been given access to the programs he needs to help with that. But I should have some intro numbers for you at my next visit. I can say that Dr Somerhiser has noticed an increase in the number of AD members in her classes! You're doing great! Thank you for the effort!
I will be back in clinic the week of 17 Sep to update you, answer questions and brief anyone new. Until then, Airman Crumb is still my POC.

Week 6

We are now in week 6! How is it going? By now, screening for overweight/obesity should start feeling more like a habit. Even though we are nearing the completion of this project, I hope that you will continue with the recommendation of screening patients for weight issues and scheduling them for our BHOP weight management program even after my portion ends. This is an important issue when it comes to mission readiness, not to mention our patients' overall health.
I continue to be interested in any feedback you'd like to offer about the project itself, or the process change that's been implemented.
I will be in clinic October 2nd and 3rd, or you can go to Airman Crumb or Captain Lang.

Week 8

We are now in week 8 of implementation! Again, thank you for all of the effort you have put into this project. This is the final week that you will be receiving emails from me to remind you about the project. The next four weeks involves letting you continue, on your own, without reminders or prompts (other than the "cheat sheets" that were placed on your monitor. Airman Crumb for Family Practice and Captain Lang in Flight Medicine continue to be the POC for their respective flights if you have any questions during this time.

APPENDIX E: TEMPLATE FOR INITIATING WEIGHT MANAGEMENT CONVERSATION

Sir/Ma'am, based on your height and weight, your BMI is calculating at _____. This puts you in a category of (overweight/obese). As I'm sure you already know, being overweight/obese puts you at risk for comorbidities such as hypertension, diabetes, joint pain, even depression. It can also affect mission readiness. Our BHOP providers offer an effective weight management small-group classes and one-on-one appointments as well.
I have a class/appointment available with Dr_____ on (Date) at (Time). Will that work for you? (If not, offer other days/times or ask them what day/time works best for them.

If the patient has questions about how a BHOP appointment might be helpful for weight management, please provide a couple of examples of typical interventions that the BHOP might recommend. For example:

The BHOP might work with you on:

- *Setting eating behavior changes that fit within your lifestyle and values that can make it easier lose weight and keep it off*
- *Setting a physical activity plan that fits within your lifestyle and values that can make it easier lose weight and keep it off*
- *Setting a plan to help manage stress. For many people being able to effectively manage stress makes it easier to lose weight and keep it off*

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